Final Report Briefing

Updating the AATT Concept of Air Traffic Management Operations

NASA Contract
NAS2-98005 RTO 35

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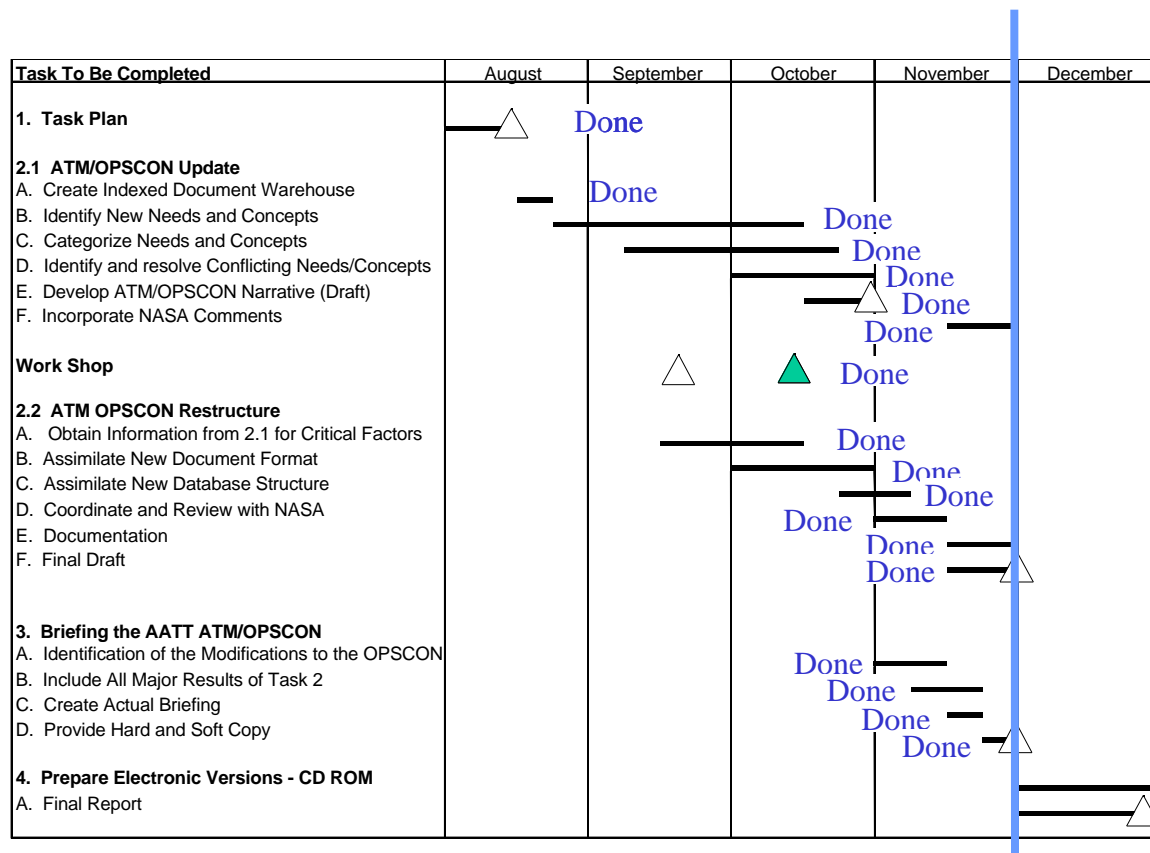
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TO-35 Agenda

- Status
- Final Document Format
- Source Data
- Results and Conclusions
- Recommendations
- Delivery of Draft Final Report, Draft AATT00, and CD-ROM
- Steps to Complete the Effort
- Action Item Review

TO-35 Plan and Status

- Schedule Status
  - All Tasks on Schedule
  - NASA Review to be Performed
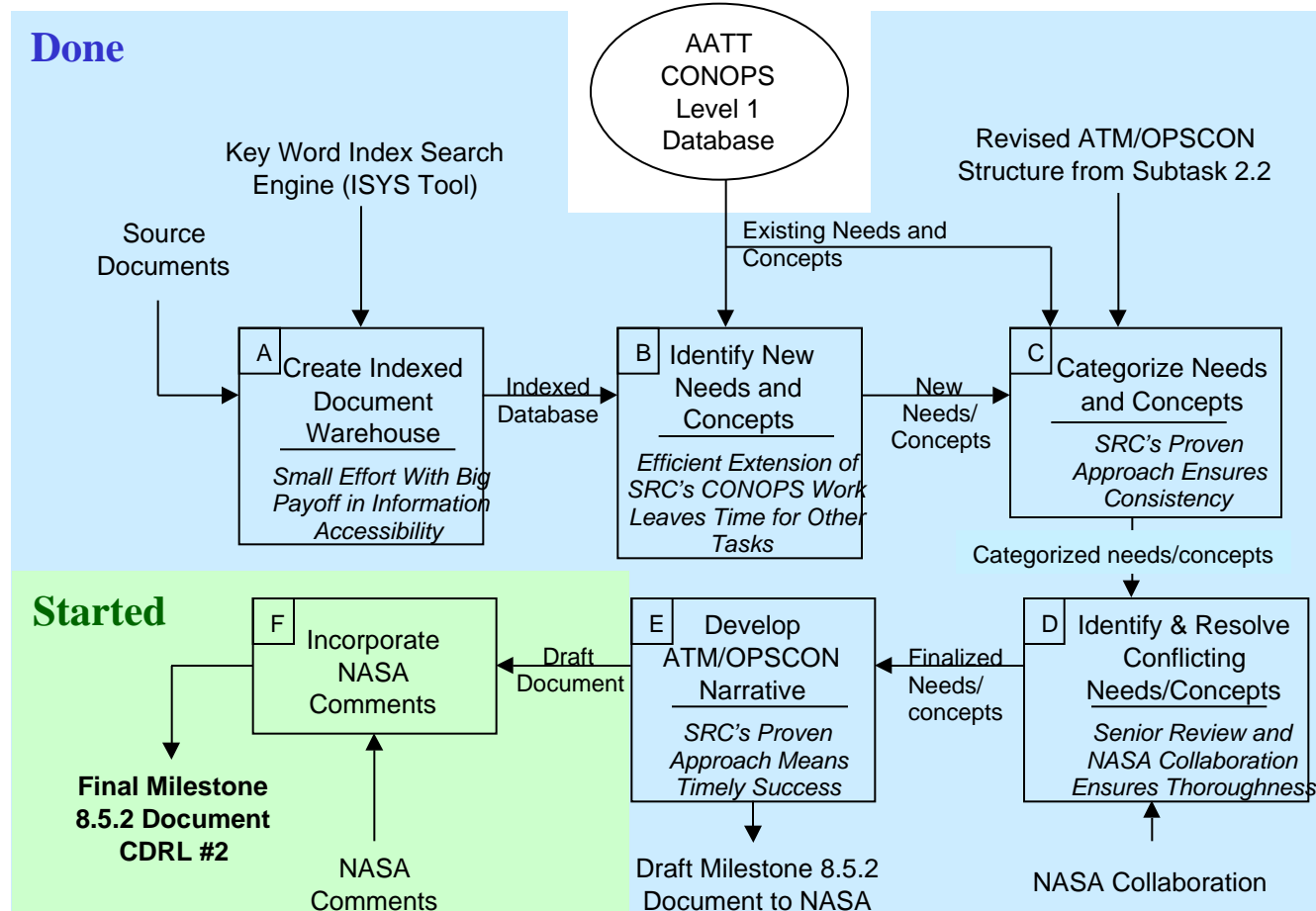 - SRC Finalization to be Performed

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Schedule Status

Task To Be Completed	August	September	October	November	December
1. Task Plan	△ Done				
2.1 ATM/OPSCON Update					
A. Create Indexed Document Warehouse		Done			
B. Identify New Needs and Concepts			Done		
C. Categorize Needs and Concepts			Done		
D. Identify and resolve Conflicting Needs/Concepts				Done	
E. Develop ATM/OPSCON Narrative (Draft)				△ Done	
F. Incorporate NASA Comments				Done	
Work Shop		△	▲ Done		
2.2 ATM OPSCON Restructure					
A. Obtain Information from 2.1 for Critical Factors			Done		
B. Assimilate New Document Format			Done		
C. Assimilate New Database Structure				Done	
D. Coordinate and Review with NASA			Done		
E. Documentation				Done	
F. Final Draft				Done △	
3. Briefing the AATT ATM/OPSCON					
A. Identification of the Modifications to the OPSCON				Done	
B. Include All Major Results of Task 2				Done	
C. Create Actual Briefing				Done	
D. Provide Hard and Soft Copy				Done △	
4. Prepare Electronic Versions - CD ROM					
A. Final Report					△

TO-35 Plan and Status

- Technical Status

  - Following Defined Technical Approach

  - No Exceptions Noted in Technical Approach

Technical Status

Done

Key Word Index Search
Engine (ISYS Tool)

AATT
CONOPS
Level 1
Database

Revised ATM/OPSCON
Structure from Subtask 2.2

Source
Documents

Existing Needs and
Concepts

A Create Indexed
Document
Warehouse

*Small Effort With Big
Payoff in Information
Accessibility*

Indexed
Database

B Identify New
Needs and
Concepts

*Efficient Extension of
SRC's CONOPS Work
Leaves Time for Other
Tasks*

New
Needs/
Concepts

C Categorize Needs
and Concepts

*SRC's Proven
Approach Ensures
Consistency*

Categorized needs/concepts

Started

F Incorporate
NASA
Comments

Draft
Document

E Develop
ATM/OPSCON
Narrative

*SRC's Proven
Approach Means
Timely Success*

Finalized
Needs/
concepts

D Identify & Resolve
Conflicting
Needs/Concepts

*Senior Review and
NASA Collaboration
Ensures Thoroughness*

**Final Milestone
8.5.2 Document
CDRL #2**

NASA
Comments

Draft Milestone 8.5.2
Document to NASA

NASA Collaboration

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Source Documents

Identified New Needs and Concepts by Source

Sponsor Organization	Source Title	Source Date	Number of New OPSCONS	Availability: E=Electronic H=Hardcopy
FAA	ATS Concept of Operations for the National Airspace System in 2005 – Narrative	1997	22	E;H
FAA	Addendum 1: Operational Tasks & Scenarios	1998	21	E;H
FAA	National Airspace System Architecture, Version 4.0	1999	36	E;H
RTCA	A Joint Government/Industry Operational Concept for the Evolution of Free Flight (RTCA)	1997	31	E;H
DoD	Joint Precision Approach and Landing System (JPALS)	1998	0	H
NASA	Level I and II CONOPS Databases (derived from the Narrative & Addendum)	1999	0	E;H
FAA	Safe Flight 21 Functional Specification	1999	9	E;H
Mitre	ATS Concept of Operations for the National Airspace System for the Mature State of Free Flight (Mitre 2015)	1998	12	E;H
FAA	Air Traffic Services Performance Plan for Fiscal Years 1998-2000	1997	5	E;H
Eurocontrol	Air Traffic Management Strategy for 2000+ (Vol. 1)	1998	0	E;H
Eurocontrol	Air Traffic Management Strategy for 2000+ (Vol. 2)	1998	4	E;H
NASA	Concept Definition of Distributed Air/Ground Traffic Management (DAG-TM) (Version 1.0)	1999	16	E;H
NASA	AATT Program Plans, Level 2 and 3	1999	0	E; H

Source Documents Continued

NASA	AATT Product Descriptions	1998	0	E;H
RTCA	Government/Industry Guidelines and Concept for National Airspace Analysis and Redesign (RTCA)	1998	0	N/A
NASA	Gulf of Mexico (GoMex) Needs Assessment	1999	0	E;H
NASA	GoMex Preferred Development Path	1998	0	H
NASA	The Application of the QFD (Quality Function Deployment -risk assessment) Methodology to the AATT Program	1998	0	E;H
NASA	AATT Systems Engineering Management Plan	1999	0	E;H
NASA	RTO#1-Feasibility Study and Requirements Definition for Cooperative Human-Adaptive Traffic Simulation (CHATS)	1998	0	E;H
NASA	RTO#2-Analysis of Aviation Research and Development Programs with Respect to the Level I Concepts of Operation	1999	0	E;H
NASA	RTO#7-Constrained En Route Airspace Problems	1999	2	E;H
NASA	RTO#16-Multi-Facility TMA Requirements for Philadelphia Installation	1999	2	E;H
NASA	RTO#22-Free Flight Simulation Traffic Scenario Development	N/A	N/A	N/A
NASA	RTO#23- Assessment of Research and Development Efforts Supporting Future Operational Concepts for the National Airspace	1999	16	E;H
NASA	RTO#29-Software Design and Implementation of APATH Trajectory Optimization, Hazard resolution, and Flight Rules Components	N/A	N/A	N/A
NASA	RTO#31-APATH …Inferring Aircraft Intent …	N/A	N/A	N/A
TOTAL NUMBER OF NEW OPSCONS			**176**	

N/A- Not Appliciable

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Indexed Document Warehouse

Block A

- **All Electronic Copies Available**

- **All Data Used in RTO-23 Analysis**

- **Indexed to Allow Quick Key-Word Searching**

- **To be Used in Block D Analysis**

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Indexed Document Warehouse

Block A

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Potential OPSCONs Identification

Block B

- **Review Each of the Source Documents by SRC Analyst**
- **Identify Potential OPSCONs**
  - Clearly Not in Current OPSCONs List
  - Include Context Paragraph and Hyperlink
- **Insert Potential OPSCONs in an Excel Spreadsheet**
- **Second Source Review by Another Analyst**
- **Review First Analyst Potential OPSCON List**
  - Identify Any Additional Potential New OPSCONs
- **Third Source Review to Finalize Potential OPSCONs**

Preliminary OPSCON Spreadsheet

- Document Title

- Potential OPSCON Description - Idea

- Page Where the Potential OPSCON Was Found

- Potential OPSCON With Supporting Context

- Possible Keywords

- Categorization

- Phase of Flight

- Analyst Initials (removed for final report)

Excel Spreadsheet Example

DOC	IDEA	PAGE	OPS CON and SURROUNDING (SUPPORTING) CONTENT	KEYWORDS	C	N	S	W	A	M	H	1	2	3	4	5	6	7	8	CH	KM	BT	TH
Arch 4.0	Situation Displays for Ground Vehicles	4-5	*New traffic situation displays will allow* service providers *& ground vehicle operators to maintain situational awareness of all moving a/c & veh their areas. This will help* pilots follow taxi instruction *& ground vehicle operato avoid conflicts w/aircraft.*	Situation Displays, Ground Vehicles	C		S		A					3								X		Y

- **The following is a description of the above example:**
  - Column 1 is the document title: Architecture 4.0
  - Column 2 is the OPSCON idea
  - Column 3 is the page number where the CONOPS is found: This is in blue font and is hyper-linked to the document
  - Column 4 is the OPSCON and Surrounding (Supporting) Content: The bold italicized font is what the actual OPSCON will be. The regular font is supporting context.
  - Column 5 contains any possible keywords
  - Columns 6-12 contain the Function categorizations
  - Columns 13-20 contain the Phase of Flight categorizations
  - Columns 21-24 contain the Analyst initials: The initial analyst (KM) marks the column with an "X" to show that he/she identified the new OPSCON. The reviewing analyst (TH) marked the appropriate column with an "Y" to show that he agrees with the new OPSCON. Either a "Y" (yes) or a "N" (no) will appear in the remaining columns depending on whether or not the analyst agrees with the identification of the OPSCON. Any "N" will be discussed until a agreement has been made.

Categorization

Block C

- **Categorization of the Potential OPSCONs Is Concurrent With Identification and Is the Same As for AATT CONOPS**

  - **There Are Seven Categories - The First Six are Functions:**
    - C - Communication
    - N - Navigation
    - S - Surveillance
    - W - Weather
    - A - Automation
    - M - Maintenance/facilities
    - H - Human Factors

  - **There Are Eight Categories for Phases of Flight:**
    - 1 - Introduction
    - 2 - Flight Planning
    - 3 - Surface
    - 4 - Arrival/departure
    - 5 - En Route
    - 6 - Oceanic
    - 7 - NAS Management
    - 8 - Management

Conflict Resolution

Block D

- **Once the Potential OPSCONs were Identified, There were Three Additional Steps**
  - Identify Which Are the New OPSCONs
    - Performed by SRC With Consultation With NASA
  - Resolve Conflicts Between New/Original OPSCONs
    - Differences Between the Original OPSCONs and the New OPSCONs
    - Performed Internally by SRC.
  - Resolve Conflicts Among the New OPSCONs
    - Duplications Were Eliminated or Consolidated.
    - Differences and Contradictions Were Resolved - No Major Issues Were Identified.

Conflict Resolution Continued

Block D (continued)

- NASA Collaboration Through Discussion and OPSCON List Review

- OPSCONs List was Finalized During this Phase

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Develop Document

Block E

- **Outline for Document is Based on**
  - Draft Operational Concept Template, Version 1.0 (1999)
  - Original AATT OPSCON Document (1997)
  - AIAA "Guide for Preparation of Operational Concept Documents," 1993
  - Others Compared in a Large Table (Provided)
  - Modified per Input from the October 13th Workshop.

Develop Document Continued

Block E (Continued)

- **Developed to Meet These Objectives:**
    - All OPSCONs are Traceable to Source
    - New OPSCON Document Traceable to Old Document
    - Supportable in Future Instantiations
    - OPSCONs are Self-Contained and Modular (As is Possible)
    - CD-ROM Version Includes Hyperlinks
    - Hard Copy Document Printable from CD-ROM

Final Document (CDRL Item # 2)

Block F

- **Incorporated NASA Comments in Final Draft**

- **Deliver Hard Copies and CD-ROMS**

- **This Effort Starts with this Presentation and Delivery of the Draft Final Documents and CD-ROM**

Document Format

- **CD-ROM Document Printable**
- **Printed Version (example provided)**
  - Based on Analysis of OPSCON Contents
    - Expanded Comparison in One Matrix
  - Includes TBDs - Missing Content Descriptions
- **CD-ROM Version (example provided)**
  - Includes Guidance for Use of the CD-ROM
  - Includes All TO-35 Program Deliveries
  - Includes Hyper-links between Old, New, OPSCONs List, and Source Documents

Results and Conclusions

- Development from Multiple Sources is Feasible
- Assessment of the Impact of a Document Can be Made by Calculating the OPSCONs Changed or Added
- An Effective Development Approach Has Been Identified and Proven

Recommendations

- Complete Development of the AATT ATM/OPSCON

- Update the RTO 23 Research and Development Gap Analysis to Include a Broader Base of Programs and the Revised AATT ATM/OPSCON

- Develop a World Wide Web Application With Intelligent Search Capability

Delivery of Draft Final Report and CD-ROM

- Draft Final Hardcopy of the Report
- Draft Final CD-ROM of the Report

Steps to Complete the Effort

- Review and Comment By NASA
- Inclusion of NASA Comments in the Final Report
- Delivery of the Final Report